Rates of Infections and Clinical Outcomes after Intracerebral Hemorrhage

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Infection after intracerebral hemorrhage (ICH) is a common type of complication that can adversely affect clinical outcomes at hospital discharge. The aim of this project was to report rates of infection in a of ICH patients and to compare clinical outcomes between infected and non-infected subjects.

Background

- Intracerebral hemorrhage (ICH) is a leading cause of disability and mortality.
- Infections are a common complication observed in ICH and might be associated with worse outcomes.

Inclusion Criteria	Exclusion Criteria
• Age >18 • ICH diagnosed by imaging • Complete medical record for entire hospital course	• Incomplete documentation on EMR • No definite ICH diagnosis

Figure 1. Inclusion and exclusion criteria.

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Objectives

1. To identify the prevalence of infections in an ICH sample.
2. To assess the different type of infections present and identify the most common types (pneumonia, urinary tract infection: UTI, bacteremia).
3. To compare outcome at discharge (Glasgow Outcome Scale: GOS and discharge disposition) between infected and non-infected subjects.

Methods

- Retrospective review of consecutive patients with ICH admitted to the Baylor-St. Luke's Medical Center Neurosciences Critical Care Unit (NCCU) (January 2008 – December 2012) (Figure 1).
- Demographics, baseline characteristics, occurrence of infections (identified by chart review), type of infection (pneumonia, UTI, bacteremia) were collected.
- Patients divided in infected and non-infected groups.
- Rates of infections and outcome at discharge (GOS, discharge disposition) were compared between the two groups using multivariate logistic regression model.

Table 1. General patient demographics, infection rates and comparison among infected and non-infected patients.

	n	%
Infections	141	23.5
UTI		45.2
Pneumoniae		28.8
Bacteremia		19.2

	Non-infected (%)	Infected (%)	*p*-value
Female	55.6	56.4	0.0765
Poor outcome (GOS < 4)	42.8	63.8	0.0168
Unfavorable disposition (LTAC, SNF, hospice, death)	42.2	62.4	0.0040

Figure 2. Outcome (GOS) comparison in infected and non-infected patients.

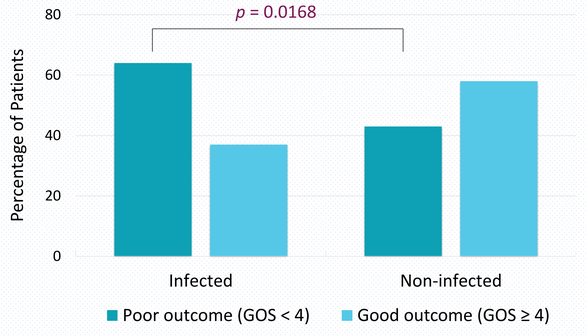
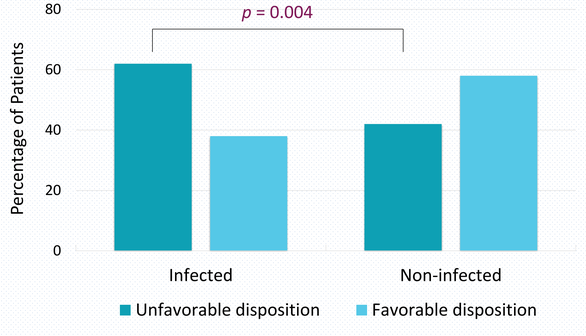


Figure 3. Discharge disposition comparison in infected and non-infected patients.



Infection rates in our samples were comparable to other recently reported ICH cohorts.

Results

- 604 patients with ICH were included (55.7% female).
- Infections were identified in 141 patients (23.5%) (Table 1).
- UTI was the most common infection (45.2%) followed by pneumonia (28.8%) and bacteremia (19.2%) (Table 1).
- Clinical outcome was significantly worse for subjects who experienced any type of infection during hospitalization, compared to non-infected subjects.
- Poor outcome (GOS < 4) was found on 63.8% and 42.8% for the infected and non-infected groups respectively ($p = 0.0168$) (Figure 2).
- Unfavorable discharge disposition (LTAC, SNF, hospice, death) was higher in the infection group compared to the non-infected group, 62.4% and 42.2%, respectively ($p = 0.004$) (Figure 3).
- This increased risk was significant after controlling for gender, ethnicity, admission GCS, admission NIHSS and admission mRS.

Conclusions

- Infection rates in our sample were comparable to other recent ICH infection rates reported.
- Our study shows a significant association between infections and poor clinical outcomes at hospital discharge after controlling for admission status.
- We additionally demonstrated a higher risk for unfavorable discharge disposition for infected patients.
- Further large prospective studies are required.

Poor clinical outcome (GOS and unfavorable disposition) was more frequent for the infected patients.